economy data is specified in this paragraph.

(1) The Highway Fuel Economy Driving Schedule is set forth in appendix I to this part. The driving schedule is defined by a smooth trace drawn through the specified speed versus time relationships.

(2) The speed tolerance at any given time on the dynamometer driving schedule specified in appendix I, or as printed on a driver's aid chart approved by the Administrator, when conducted to meet the requirements of paragraph (b) of § 600.111 is defined by upper and lower limits. The upper limit is 2 mph higher than the highest point on trace within 1 second of the given time. The lower limit is 2 mph lower than the lowest point on the trace within 1 second of the given time. Speed variations greater than the tolerances (such as may occur during gear changes) are acceptable provided they occur for less than 2 seconds on any occasion. Speeds lower than those prescribed are acceptable provided the vehicle is operated at maximum available power during such occurrences.

(3) A graphic representation of the range of acceptable speed tolerances is found in paragraph (c) of § 86.115 of this chapter.

§ 600.110–08 Equipment calibration.

The equipment used for fuel economy testing must be calibrated according to the provisions of §§ 86.116 and 86.216 of this chapter.

[71 FR 77933, Dec. 27, 2006]

§ 600.110–78 Equipment calibration.

The equipment used for fuel economy testing must be calibrated according to the provisions of § 86.116 of this chapter.

§ 600.111–08 Test procedures.

This section provides test procedures for the FTP, highway, US06, SC03, and the cold temperature FTP tests. Testing shall be performed according to test procedures and other requirements contained in part 86 and part 600 of this chapter, including the provisions of part 86, subparts B, C, and S.

(a) *FTP testing procedures.* The test procedures to be followed for conducting the FTP test are those prescribed in §§ 86.127 through 86.138 of this chapter, as applicable, except as provided for in paragraph (b)(5) of this section. (The evaporative loss portion of the test procedure may be omitted unless specifically required by the Administrator.)

(b) *Highway fuel economy testing procedures.* (1) The Highway Fuel Economy Dynamometer Procedure (HFET) consists of preconditioning highway driving sequence and a measured highway driving sequence.

(2) The HFET is designated to simulate non-metropolitan driving with an average speed of 48.6 mph and a maximum speed of 60 mph. The cycle is 10.2 miles long with 0.2 stop per mile and consists of warmed-up vehicle operation on a chassis dynamometer through a specified driving cycle. A proportional part of the diluted exhaust emission is collected continuously for subsequent analysis of hydrocarbons, carbon monoxide, carbon dioxide using a constant volume (variable dilution) sampler. Diesel dilute exhaust is continuously analyzed for hydrocarbons using a heated sample line and analyzer. Methanol and formaldehyde samples are collected and individually analyzed for methanol-fueled vehicles (measurement of methanol and formaldehyde may be omitted for 1993 through 1994 model year methanol-fueled vehicles provided a HFID calibrated on methanol is used for measuring HC plus methanol).

(3) Except in cases of component malfunction or failure, all emission control systems installed on or incorporated in a new motor vehicle must be functioning during all procedures in this subpart. The Administrator may authorize maintenance to correct component malfunction or failure.

(4) *Transmission.* The provisions of § 86.128 of this chapter apply for vehicle transmission operation during highway fuel economy testing under this subpart.

(5) *Road load power and test weight determination.* § 86.129 of this chapter applies for determination of road load power and test weight for highway fuel economy testing. The test weight for the testing of a certification vehicle will be that test weight specified by

the Administrator under the provisions of part 86 of this chapter. The test weight for a fuel economy data vehicle will be that test weight specified by the Administrator from the test weights covered by that vehicle configuration. The Administrator will base his selection of a test weight on the relative projected sales volumes of the various test weights within the vehicle configuration.

(6) *Vehicle preconditioning.* The HFET is designed to be performed immediately following the Federal Emission Test Procedure, §§ 86.127 through 86.138 of this chapter. When conditions allow, the tests should be scheduled in this sequence. In the event the tests cannot be scheduled within three hours of the Federal Emission Test Procedure (including one hour hot soak evaporative loss test, if applicable) the vehicle should be preconditioned as in paragraph (b)(6) (i) or (ii) of this section, as applicable.

(i) If the vehicle has experienced more than three hours of soak (68 °F–86 °F) since the completion of the Federal Emission Test Procedure, or has experienced periods of storage outdoors, or in environments where soak temperature is not controlled to 68 °F–86 °F, the vehicle must be preconditioned by operation on a dynamometer through one cycle of the EPA Urban Dynamometer Driving Schedule, § 86.115 of this chapter.

(ii) In unusual circumstances where additional preconditioning is desired by the manufacturer, the provisions of § 86.132(a)(3) of this chapter apply.

(7) *Highway fuel economy dynamometer procedure.* (i) The dynamometer procedure consists of two cycles of the Highway Fuel Economy Driving Schedule (§ 600.109(b)) separated by 15 seconds of idle. The first cycle of the Highway Fuel Economy Driving Schedule is driven to precondition the test vehicle and the second is driven for the fuel economy measurement.

(ii) The provisions of § 86.135 (b), (c), (e), (f), (g), (h) and (i) Dynamometer procedure of this chapter, apply for highway fuel economy testing.

(iii) Only one exhaust sample and one background sample are collected and analyzed for hydrocarbons (except diesel hydrocarbons which are analyzed continuously), carbon monoxide, and carbon dioxide. Methanol and formaldehyde samples (exhaust and dilution air) are collected and analyzed for methanol-fueled vehicles (measurement of methanol and formaldehyde may be omitted for 1993 through 1994 model year methanol-fueled vehicles provided a HFID calibrated on methanol is used for measuring HC plus methanol).

(iv) The fuel economy measurement cycle of the test includes two seconds of idle indexed at the beginning of the second cycle and two seconds of idle indexed at the end of the second cycle.

(8) Engine starting and restarting. (i) If the engine is not running at the initiation of the highway fuel economy test (preconditioning cycle), the start-up procedure must be according to the manufacturer's recommended procedures.

(ii) False starts and stalls during the preconditioning cycle must be treated as in § 86.136(d) and (e). If the vehicle stalls during the measurement cycle of the highway fuel economy test, the test is voided, corrective action may be taken according to § 86.1834–01 as applicable, and the vehicle may be rescheduled for test. The person taking the corrective action shall report the action so that the test records for the vehicle contain a record of the action.

(9) *Dynamometer test run.* The following steps must be taken for each test:

(i) Place the drive wheels of the vehicle on the dynamometer. The vehicle may be driven onto the dynamometer.

(ii) Open the vehicle engine compartment cover and position the cooling fan(s) required. Manufacturers may request the use of additional cooling fans or variable speed fan(s) for additional engine compartment or under-vehicle cooling and for controlling high tire or brake temperatures during dynamometer operation. With prior EPA approval, manufacturers may perform the test with the engine compartment closed, e.g. to provide adequate air flow to an intercooler (through a factory installed hood scoop). Additionally, the Administrator may conduct fuel economy testing using the additional cooling set-up approved for a specific vehicle.

(iii) Preparation of the CVS must be performed before the measurement highway driving cycle.

(iv) *Equipment preparation.* The provisions of § 86.137(b)(3) through (6) of this chapter apply for highway fuel economy test except that only one exhaust sample collection bag and one dilution air sample collection bag need be connected to the sample collection systems.

(v) Operate the vehicle over one Highway Fuel Economy Driving Schedule cycle according to the dynamometer driving schedule specified in § 600.109(b).

(vi) When the vehicle reaches zero speed at the end of the preconditioning cycle, the driver has 17 seconds to prepare for the emission measurement cycle of the test.

(vii) Operate the vehicle over one Highway Fuel Economy Driving Schedule cycle according to the dynamometer driving schedule specified in § 600.109(b) while sampling the exhaust gas.

(viii) Sampling must begin two seconds before beginning the first acceleration of the fuel economy measurement cycle and must end two seconds after the end of the deceleration to zero. At the end of the deceleration to zero speed, the roll or shaft revolutions must be recorded.

(10) For alcohol-based dual fuel automobiles, the procedures of § 600.111(a) and (b) shall be performed for each of the fuels on which the vehicle is designed to operate.

(c) *US06 testing procedures.* The test procedures to be followed for conducting the US06 test are those prescribed in § 86.159 of this chapter, as applicable.

(d) *SC03 testing procedures.* The test procedures to be followed for conducting the SC03 test are prescribed in §§ 86.160 through 161 of this chapter, as applicable.

(e) *Cold temperature FTP procedures.* The test procedures to be followed for conducting the cold temperature FTP test are generally prescribed in subpart C of part 86 of this chapter, as applicable. For the purpose of fuel economy labeling, diesel vehicles are subject to cold temperature FTP testing, but are not required to measure particulate matter, as described in § 86.210–08 of this chapter.

(f) *Special test procedures.* The Administrator may prescribe test procedures, other than those set forth in this subpart B, for any vehicle which is not susceptible to satisfactory testing and/or testing results by the procedures set forth in this part. For example, special test procedures may be used for advanced technology vehicles, including, but not limited to battery electric vehicles, fuel cell vehicles, plug-in hybrid electric vehicles and vehicles equipped with hydrogen internal combustion engines. Additionally, the Administrator may conduct fuel economy and carbon-related exhaust emission testing using the special test procedures approved for a specific vehicle.

[71 FR 77933, Dec. 27, 2006, as amended at 74 FR 61549, Nov. 25, 2009; 75 FR 25704, May 7, 2010]

§ 600.111–80 Test procedures.

(a) The test procedures to be followed for generation of the city fuel economy data are those prescribed in §§ 86.127–94 through 86.138–78 of this chapter, as applicable. (The evaporative and refueling loss portions of the test procedure may be omitted unless specifically required by the Administrator.)

(b) The test procedures to be followed for generation of the highway fuel economy data are those specified in § 600.111–78 (b) through (h) inclusive.

(1) The Highway Fuel Economy Dynamometer Procedure consists of a preconditioning highway driving sequence and a measured highway driving sequence.

(2) The highway fuel economy test is designated to simulate non-metropolitan driving with an average speed of 48.6 mph and a maximum speed of 60 mph. The cycle is 10.2 miles long with 0.2 stops per mile and consists of warmed-up vehicle operation on a chassis dynamometer through a specified driving cycle. A proportional part of the diluted exhaust emissions is collected continuously for subsequent analysis using a constant volume (variable dilution) sampler. Diesel dilute exhaust is continuously analyzed for hydrocarbons using a heated sample line and analyzer.